CLAIMS

1.   A wireless communication system, operable with a plurality of remote stations capable of transmission on a shared resource, comprising:

a receiver for receiving a plurality of access requests for transmission on the shared resource from a respective plurality of remote stations;

a scheduler for allocating a portion of the shared resource to zero or more of the requesting remote stations in response to the plurality of access requests, the allocation comprising zero or more individual access grants to zero or more requesting remote stations and zero or one common access grant to the remaining requesting remote stations; and

a transmitter for transmitting the individual access grants to the respective remote stations on one or more individual grant channels and for transmitting the common access grant to the remaining remote stations on one or more common grant channels.

2.   The apparatus of claim 1, further operable with the plurality of remote stations equipped to transmit autonomously on the shared resource, using a limited portion of the shared resource, without an access request or access grant, and wherein the scheduler computes the expected amount of the shared resource to be consumed by the autonomous transmissions and allocates the portion of the shared resource for individual and common access grants in response thereto.

3.   The apparatus of claim 1, wherein an individual grant may allocate a portion of the shared resource that is greater than, less than, or equal to any other individual or common grant.

4.   The apparatus of claim 1, wherein the grant comprises a maximum traffic to pilot ratio (T/P).

5.   The apparatus of claim 1, wherein the grant comprises a transmission rate.

6.   The apparatus of claim 1, wherein the grant comprises a transmission power level.

7.   The apparatus of claim 1, wherein the grant comprises a modulation format.

8.   The apparatus of claim 1, wherein the individual grants are allocated to relatively higher geometry remote stations.

9.   The apparatus of claim 1, wherein the scheduler determines the allocation in response to one or more Quality of Service (QoS) levels.

10.   The apparatus of claim 1, wherein the individual grants are valid for a first time duration and the common grant is valid for a second time duration, the second time duration greater than the first time duration.

11.   The apparatus of claim 1, wherein the individual grants comprise a duration flag, the duration flag indicating the individual grant is for a first time duration or one or more additional time durations, and one or more of the one or more additional time durations are longer than the first time duration.

12.   The apparatus of claim 11, wherein the common grant is for a second time duration, the second time duration longer than the first time duration.

13.   The apparatus of claim 1, wherein an individual grant command is transmitted for a first time duration and a common grant command is transmitted for a second time duration, the second time duration longer than the first time duration.

14.   The apparatus of claim 1, further operable with one or more remote stations transmitting with permission from one or more access grants, the apparatus further comprising:
        a decoder for decoding one or more received packets and determining if the one or more received packets decoded without error; and
        wherein:
        the receiver further receives the one or more packets of data from one or more remote stations, respectively;

the transmitter further transmits to the one or more remote stations an acknowledgment and grant extension (ACK-and-Continue) command, respectively, when the respective received packet decoded without error and the access grant for the respective remote station is to be extended; and

the scheduler determines the allocation of the portion of the shared resource in accordance with individual and common grants extended with the one or more ACK-and-Continue commands.

15. A base station, operable with a remote station transmitting with permission from an access grant, comprising:

a receiver for receiving a packet of data from the remote station;

a decoder for decoding the received packet and determining if the received packet decoded without error; and

a transmitter for transmitting to the remote station a negative acknowledgment (NAK) command when the received packet did not decode without error, an acknowledgment and grant extension (ACK-and-Continue) command when the received packet decoded without error and the access grant for the remote station is to be extended, and an acknowledgment (ACK) when the received packet decoded without error and the access grant is not to be extended.

16. The apparatus of claim 15, wherein an ACK is transmitted with a first value, an ACK-and-Continue is transmitted with a second value, and a NAK is not transmitted.

17. The apparatus of claim 16, wherein the first and second values are of opposite polarity.

18. A remote station, comprising:

a data buffer for receiving data for transmission;

a message generator for generating an access request message when the data buffer contains data for transmission;

a receiver for receiving one or more individual grant channels and one or more common grant channels from a base station;

a message decoder for decoding an access grant directed to the remote station, the access grant comprising an individual grant directed on one of the one or more

individual grant channels or a common grant on one of the one or more common grant channels; and

a transmitter for transmitting the access request message and for transmitting a portion of data from the data buffer in response to a decoded access grant.

19. The remote station of claim 18, wherein the transmitter further transmits a limited portion of the data in the data buffer autonomously, irrespective of whether an access grant has been received.

20. The remote station of claim 18, wherein the transmitter transmits on one of a plurality of channels subsequent to a received grant.

21. The remote station of claim 18, wherein the transmitter transmits on two or more of a plurality of channels subsequent to a received grant.

22. The remote station of claim 21, wherein the received grant is an individual grant, comprising a long grant flag, the long grant flag asserted.

23. The remote station of claim 21, wherein the received grant is a common grant.

24. The remote station of claim 18, wherein a grant comprises a T/P value.

25. The remote station of claim 24, further comprising a processor for selecting transmission parameters based on a T/P value.

26. The remote station of claim 25, wherein the transmission parameters comprise an encoder packet size.

27. The remote station of claim 25, wherein the transmission parameters comprise an expected number of subpacket transmissions.

28. The remote station of claim 27, wherein the number of expected subpacket transmissions selected is the maximum number of subpacket transmissions.

29.   The remote station of claim 27, wherein the number of expected subpacket transmissions selected is less than the maximum number of subpacket transmissions.

30.   The remote station of claim 25, wherein the transmission parameters comprise a modulation format.

31.   The remote station of claim 25, wherein the transmission parameters comprise a transmit power level for a secondary pilot channel.

32.   The remote station of claim 25, wherein the processor reduces the T/P when the transmitter has insufficient transmit power to transmit according to the unreduced T/P.

33.   The remote station of claim 18, wherein:
      the receiver further receives an ACK-and-Continue command; and
      the transmitter transmits an additional portion of data from the data buffer in response to a previously decoded access grant.

34.   The remote station of claim 18, wherein:
      the receiver further receives an ACK command; and
      the transmitter ceases transmitting data from the data buffer in response to a previously decoded access grant.

35.   The remote station of claim 34, wherein the transmitter further transmits a limited portion of the data in the data buffer autonomously, subsequent to a received ACK.

36.   The remote station of claim 18, wherein:
      the receiver further receives a NAK command; and
      the transmitter retransmits the portion of data from the data buffer previously transmitted in response to a previously decoded access grant.

37.   The remote station of claim 18, wherein the message generator generates an access request message conditioned on the amount of data in the data buffer exceeding a pre-determined threshold.

38. The remote station of claim 18, wherein the message generator generates an access request message conditioned on a Quality of Service (QoS) service level.

39. The remote station of claim 18, wherein the message generator generates an access request message conditioned on re-request conditions being satisfied with respect to a previously generated access request message.

40. The remote station of claim 18, wherein the message generator generates an access request message conditioned on desired data transmission latency.

41. The remote station of claim 18, wherein the message generator generates an access request message conditioned on desired data transmission throughput.

42. A remote station, comprising:

a message encoder for encoding an access request message, the access request message comprising at least one of an indicator of an amount of data for transmission, a supportable T/P, or a QoS indicator.

43. An access message, comprising at least one of an indicator of an amount of data for transmission, a supportable T/P, or a QoS indicator.

44. A base station, comprising:

a message encoder for encoding a grant message, the grant message comprising at least one of a remote station identifier, a granted T/P, a long grant flag, or a QoS indicator.

45. A grant message, comprising at least one of a remote station identifier, a granted T/P, a long grant flag, or a QoS indicator.

46. A wireless communication system, comprising:

a plurality of remote stations, each of a subset of which transmit an access request message to form a plurality of access request messages;

a base station for:

receiving the plurality of access request messages;

allocating a shared system resource among the plurality of remote stations; and

transmitting zero or more individual access grants to a subset of the requesting remote stations and zero or more common access grants to the remaining requesting remote stations.

47. The wireless communication system of claim 46, wherein the requesting remote stations receive the transmitted individual or common access grants and transmit data to the base station respectively in accordance therewith.

48. The wireless communication system of claim 47, wherein the base station:

receives the transmitted data from the plurality of remote stations;

decodes the received data to determine if each transmission from the plurality of remote stations was received in error; and

transmits an ACK-and-Continue command to a first subset of the plurality of remote stations to indicate that the data was received without error and to extend the previously granted common or individual grants made to the first subset of the plurality of remote stations.

49. The wireless communication system of claim 48, wherein the base station transmits an ACK command to a second subset of the plurality of remote stations to indicate that the data was received without error and to terminate the previously granted common or individual grants made to the second subset of the plurality of remote stations.

50. The wireless communication system of claim 46, wherein a second subset of the plurality of remote stations transmit data autonomously.

51. A method of access control of a shared resource, comprising:

receiving a plurality of access requests for transmission on the shared resource from a respective plurality of remote stations;

allocating a portion of the shared resource to zero or more of the requesting remote stations in response to the plurality of access requests, the allocation comprising

zero or more individual access grants to zero or more requesting remote stations and zero or one common access grant to the remaining requesting remote stations;

transmitting the individual access grants to the respective remote stations on one or more individual grant channels; and

transmitting the common access grant to the remaining remote stations on one or more common grant channels.

52.   The method of claim 51, operable with the plurality of remote stations equipped to transmit autonomously on the shared resource, using a limited portion of the shared resource, without an access request or access grant, further comprising:

computing the expected amount of the shared resource to be consumed by the autonomous transmissions and allocating the portion of the shared resource for individual and common access grants in response thereto.

53.   The method of claim 51, wherein the allocation is performed in response to one or more Quality of Service (QoS) levels.

54.   The method of claim 51, operable with one or more remote stations transmitting with permission from one or more access grants, further comprising:

decoding one or more received packets;

determining if the one or more received packets decoded without error;

transmitting to the one or more remote stations an acknowledgment and grant extension (ACK-and-Continue) command, respectively, when the respective received packet decoded without error and the access grant for the respective remote station is to be extended; and

wherein the allocation of the portion of the shared resource is performed in accordance with individual and common grants extended with the one or more ACK-and-Continue commands.

55.   A method of access control of a shared resource, comprising, operable with a remote station transmitting with permission from an access grant, comprising:

receiving a packet of data from the remote station;

decoding the received packet;

determining if the received packet decoded without error; and

transmitting to the remote station a negative acknowledgment (NAK) command when the received packet did not decode without error, an acknowledgment and grant extension (ACK-and-Continue) command when the received packet decoded without error and the access grant for the remote station is to be extended, and an acknowledgment (ACK) when the received packet decoded without error and the access grant is not to be extended.

56.   The method of claim 55, wherein an ACK is transmitted with a first value, an ACK-and-Continue is transmitted with a second value, and a NAK is not transmitted.

57.   The method of claim 56, wherein the first and second values are of opposite polarity.

58.   A method of transmission, comprising:

receiving data for transmission;

storing the data in a data buffer;

generating an access request message;

transmitting the access request message;

receiving one or more individual grant channels and one or more common grant channels from a base station;

decoding an access grant comprising an individual grant directed on one of the one or more individual grant channels or a common grant on one of the one or more common grant channels; and

transmitting a portion of data from the data buffer in response to a decoded access grant.

59.   The method of claim 58, further comprising transmitting a limited portion of the data in the data buffer autonomously, irrespective of whether an access grant has been received.

60. The method of claim 58, wherein a grant comprises a T/P value.

61. The method of claim 60, further comprising selecting transmission parameters based on the T/P value.

62. The method of claim 61, wherein the transmission parameters comprise an encoder packet size.

63. The method of claim 61, wherein the transmission parameters comprise an expected number of subpacket transmissions.

64. The method of claim 61, wherein the selecting comprises selecting the maximum number of subpacket transmissions.

65. The method of claim 61, wherein the selecting comprises selecting less than the maximum number of subpacket transmissions.

66. The method of claim 60, further comprising reducing the T/P when insufficient transmit power is available to transmit according to the unreduced T/P.

67. The method of claim 58, further comprising:
   receiving an ACK-and-Continue command; and
   transmitting an additional portion of data from the data buffer in response to a previously decoded access grant.

68. The method of claim 58, further comprising:
   receiving an ACK command; and
   ceasing transmitting data from the data buffer in response to a previously decoded access grant.

69. The method of claim 68, further comprising transmitting a limited portion of the data in the data buffer autonomously, subsequent to a received ACK.

70.   The method of claim 58, further comprising:

receiving a NAK command; and

retransmitting the portion of data from the data buffer previously transmitted in response to a previously decoded access grant.

71.   An apparatus, comprising:

means for receiving a plurality of access requests for transmission on the shared resource from a respective plurality of remote stations;

means for allocating a portion of the shared resource to zero or more of the requesting remote stations in response to the plurality of access requests, the allocation comprising zero or more individual access grants to zero or more requesting remote stations and zero or one common access grant to the remaining requesting remote stations;

means for transmitting the individual access grants to the respective remote stations on one or more individual grant channels; and

means for transmitting the common access grant to the remaining remote stations on one or more common grant channels.

72.   The apparatus of claim 71, operable with the plurality of remote stations equipped to transmit autonomously on the shared resource, using a limited portion of the shared resource, without an access request or access grant, further comprising:

means for computing the expected amount of the shared resource to be consumed by the autonomous transmissions and allocating the portion of the shared resource for individual and common access grants in response thereto.

73.   An apparatus, operable with a remote station transmitting with permission from an access grant, comprising:

means for receiving a packet of data from the remote station;

means for decoding the received packet;

means for determining if the received packet decoded without error; and

means for transmitting to the remote station a negative acknowledgment (NAK) command when the received packet did not decode without error, an acknowledgment and grant extension (ACK-and-Continue) command when the received packet decoded without error and the access grant for the remote station is to be extended, and an

acknowledgment (ACK) when the received packet decoded without error and the access grant is not to be extended.

74.   An apparatus, comprising:

means for receiving data for transmission;

means for storing the data in a data buffer;

means for generating an access request message;

means for transmitting the access request message;

means for receiving one or more individual grant channels and one or more common grant channels from a base station;

means for decoding an access grant comprising an individual grant directed on one of the one or more individual grant channels or a common grant on one of the one or more common grant channels; and

means for transmitting a portion of data from the data buffer in response to a decoded access grant.

75.   The apparatus of claim 74, further comprising means for transmitting a limited portion of the data in the data buffer autonomously, irrespective of whether an access grant has been received.

76.   A wireless communication system, comprising:

means for receiving a plurality of access requests for transmission on the shared resource from a respective plurality of remote stations;

means for allocating a portion of the shared resource to zero or more of the requesting remote stations in response to the plurality of access requests, the allocation comprising zero or more individual access grants to zero or more requesting remote stations and zero or one common access grant to the remaining requesting remote stations;

means for transmitting the individual access grants to the respective remote stations on one or more individual grant channels; and

means for transmitting the common access grant to the remaining remote stations on one or more common grant channels.

77.   The wireless communication system of claim 76, operable with the plurality of remote stations equipped to transmit autonomously on the shared resource, using a limited portion of the shared resource, without an access request or access grant, further comprising:

means for computing the expected amount of the shared resource to be consumed by the autonomous transmissions and allocating the portion of the shared resource for individual and common access grants in response thereto.

78.   A wireless communication system, operable with a remote station transmitting with permission from an access grant, comprising:

means for receiving a packet of data from the remote station;

means for decoding the received packet;

means for determining if the received packet decoded without error; and

means for transmitting to the remote station a negative acknowledgment (NAK) command when the received packet did not decode without error, an acknowledgment and grant extension (ACK-and-Continue) command when the received packet decoded without error and the access grant for the remote station is to be extended, and an acknowledgment (ACK) when the received packet decoded without error and the access grant is not to be extended.

79.   A wireless communication system, comprising:

means for receiving data for transmission;

means for storing the data in a data buffer;

means for generating an access request message;

means for transmitting the access request message;

means for receiving one or more individual grant channels and one or more common grant channels from a base station;

means for decoding an access grant comprising an individual grant directed on one of the one or more individual grant channels or a common grant on one of the one or more common grant channels; and

means for transmitting a portion of data from the data buffer in response to a decoded access grant.

80.   The wireless communication system of claim 79, further comprising means for transmitting a limited portion of the data in the data buffer autonomously, irrespective of whether an access grant has been received.

81.   Processor readable media operable to perform the following steps:

receiving a plurality of access requests for transmission on the shared resource from a respective plurality of remote stations;

allocating a portion of the shared resource to zero or more of the requesting remote stations in response to the plurality of access requests, the allocation comprising zero or more individual access grants to zero or more requesting remote stations and zero or one common access grant to the remaining requesting remote stations;

transmitting the individual access grants to the respective remote stations on one or more individual grant channels; and

transmitting the common access grant to the remaining remote stations on one or more common grant channels.

82.   The media of claim 81, operable with the plurality of remote stations equipped to transmit autonomously on the shared resource, using a limited portion of the shared resource, without an access request or access grant, further operable to perform:

computing the expected amount of the shared resource to be consumed by the autonomous transmissions and allocating the portion of the shared resource for individual and common access grants in response thereto.

83.   Processor readable media operable with a remote station transmitting with permission from an access grant and operable to perform the following steps:

receiving a packet of data from the remote station;

decoding the received packet;

determining if the received packet decoded without error; and

transmitting to the remote station a negative acknowledgment (NAK) command when the received packet did not decode without error, an acknowledgment and grant extension (ACK-and-Continue) command when the received packet decoded without error and the access grant for the remote station is to be extended, and an acknowledgment (ACK) when the received packet decoded without error and the access grant is not to be extended.

84.   Processor readable media operable to perform the following steps:

receiving data for transmission;

storing the data in a data buffer;

generating an access request message;

transmitting the access request message;

receiving one or more individual grant channels and one or more common grant channels from a base station;

decoding an access grant comprising an individual grant directed on one of the one or more individual grant channels or a common grant on one of the one or more common grant channels; and

transmitting a portion of data from the data buffer in response to a decoded access grant.

85.   The media of claim 84, further operable to perform transmitting a limited portion of the data in the data buffer autonomously, irrespective of whether an access grant has been received.